REMARKS

Claims 1-9 and 12 are pending herein.

I. The anticipation rejections based on Matsumoto et al. (US 6,523,948 B2).

The USPTO respectfully rejects Claims 1-10 and 12 under 35 U.S.C. § 102(e) as being anticipated by Matsumoto et al. Claim 10 has been cancelled. Claims 1 and 12 are independent claims.

Claim 11 is not rejected under 35 U.S.C. § 102(e). Applicants respectfully note that independent claims 1 and 12 have been amended to include the limitations of claim 11, so that claims 1 and 12 now read in relevant part:

> "wherein the control section controls the illumination on the basis of a result detected by at least one of the temperature sensor and the humidity sensor, the light comprises an ultraviolet ray, and **the liquid comprises a cationic polymerization ink containing a cationic polymerizing compound as a composition**."

As the USPTO respectfully admits on page 7 of the Office Action, "Matsumoto fails to disclose the liquid comprises a cationic polymerization ink containing a cationic polymerizing compound as a composition." Thus, it is respectfully asserted that Matsumoto does not anticipate amended independent claims 1 and 12 and dependent claims 2-9, at least because the limitations of claim 11 have been added to claims 1 and 12.

II. The obviousness rejections based on Matsumoto in view of Ohta et al. (US 6,211,265 B1).

The USPTO respectfully rejects Claim 11 under U.S.C. § 103(a) as being obvious over Matsumoto in view of Ohta et al (US 6,211,265 B1). Applicants respectfully note again that the limitations of claim 11 have been incorporated into independent claims 1 and 12. Claim 11 has been cancelled.

A. The cited references do not teach or suggest a control section that controls the illumination of light radiated from a light source on the basis of a result detected by at least one of a temperature sensor and a humidity sensor, wherein the light comprises an ultraviolet ray, as claimed in claims 1 and 12.

Regarding the limitations of claim 1 that claim in relevant part:

> "wherein the control section **controls the illumination on the basis of a result detected by at least one of the temperature sensor and the humidity sensor, the light comprises an ultraviolet ray**, and the liquid comprises a cationic polymerization ink containing a cationic polymerizing compound as a composition." **(emphasis added)**

Claim 12 claims similar limitations. No new matter is introduced by these amendments. Support for the amendments can be found on pages 15-17 of the present specification. Regarding these limitations, it is respectfully not seen where the cited references teach or suggest the claimed structure quoted above.

Specifically, on page 3 of the Office Action, the USPTO respectfully alleges that intensity adjustor 160 (as seen in Figure 19 of Matsumoto), is the specifically claimed control section. However, **intensity adjustor 160 does not control the UV emitting laser unit based on a temperature sensor or a humidity sensor**, as claimed in claims 1 and 12. Instead, as clearly noted at column 14, lines 45-52 of Matsumoto, **intensity adjustor 160 adjusts the intensity or amount of ultraviolet rays based on "an ejected amount of an ink droplet."** It is respectfully important to note that **Matsumoto never discloses that intensity adjustor 160 controls illumination of ultraviolet light on the basis of a result detected by a temperature sensor or a humidity sensor**, as claimed in claims 1 and 12.

The USPTO respectfully attempts to overcome this deficiency in Matsumoto by citing column 12, lines 25-34, which state:

> "a temperature sensor S1 and a humidity sensor S2 are provided in the ink jet printer. Output signals from the sensors S1 and S2 are input to the system controller 31. Then the drive data compensator 68 in the system controller 31 in FIG. 8 compensates for drive data to be **applied to the heating elements** according to the output signals." **(emphasis added)**"

However, it is respectfully important to note that **the adjustments based on temperature and humidity are made to the heating elements, and not the UV laser emitting units.** To reiterate, there is respectfully no indication in Matsumoto that the results of temperature

sensor S1 or humidity sensor S2 are ever used by intensity adjustor 160 to adjust UV laser emitting units 152.

Thus, in Matsumoto, it is the ejected amount of an ink droplet, and not a temperature sensor or humidity sensor, that determines how intensity adjustor 160 controls the illumination. Therefore, it is respectfully asserted that Matsumoto does not teach or suggest the specifically claimed control section of claims 1 and 12.

Additionally, Ohta does not overcome these deficiencies in the primary reference, Matsumoto, at least because Ohta respectfully does not teach or suggest controlling illumination based on a result from a humidity sensor or a temperature sensor.

In contrast, present Figures 3, 4A, and 4B illustrate one possible embodiment of the specifically claimed structure quoted above. As explained on page 16 of the present specification, **control section 20 controls the illumination of each line-shaped light source 11a-15a and 11b-15b on the basis of the results detected by temperature sensor 16 and humidity sensor 17**. Figures 4A and 4B are tables that show in detail how controller 20 controls the illumination of the light sources **based on temperature and humidity** (see pages 16-17 of the present specification for further explanation). Thus, control section 20 is a controller that controls the illumination from a light source on the basis of a result detected by at least one of the temperature sensor and the humidity sensor, as claimed in claims 1 and 12.

Thus, it is respectfully asserted that the cited references, taken either alone or in combination, do not teach or suggest all the claimed limitations of claims 1 and 12. Therefore, it is respectfully asserted that claims 1 and 12 are not obvious over the cited references.

B. Further explanation.

The apparatus of claim 1 and the apparatus of claim 12 relate to a liquid jetting apparatus which uses **a cationic polymerization ink** containing a cationic polymerizing compound as a composition. This ink is cured by an irradiation with ultraviolet ray, and the apparatus detects a temperature or humidity adjacent to a recording medium and then **controls an illumination of the ultraviolet ray** based on the detected result.

In particular, the cationic polymerization ink for ink-jetting has a photo-curable property which significantly changes according to the environment such as temperature or humidity. Specifically, in cationic polymerization ink for ink-jetting, inhibition of polymerization occurs in the presence of water. In other words, because water functions as a polymerization inhibitor in cationic polymerization ink for ink-jetting, such cationic polymerization ink is hard to polymerize in a high humidity environment. Therefore, in order to cure the cationic polymerization ink under a high humidity environment, it is required to give an irradiation of a larger illumination of ultraviolet ray. On the contrary, in a low humidity environment, it may give an ordinary illumination of ultraviolet ray because no inhibition of polymerization occurs. In a low humidity environment, if an irradiation of a larger illumination of ultraviolet ray is given, the recording medium may be adversely affected by the irradiation. Therefore, in the case of using cationic polymerization ink for ink-jetting, it is specifically required to control the illumination of ultraviolet ray according to the humidity.

Regarding temperature, after a cationic polymerization ink for ink-jetting is jetted, the ink is cured by an irradiation of ultraviolet ray. Under irradiation of ultraviolet ray, the photo curable property of the ink becomes worse at lower temperatures. In particular, the photo curable property of the inside of an ink droplet tends to be the worse in comparison with the surface of the ink droplet, because ultraviolet ray cannot penetrate deep into the inside sufficiently. It is necessary to increase the temperature of the ink to an extent when an irradiation of ultraviolet ray is given. Therefore, it is required to increase the temperature of the ink droplet by controlling the adjacent environment temperature, to improve the polymerization activity of the ink.

Because the curing property of a cationic polymerization ink for ink-jetting is strongly influenced by the environment humidity and the environment temperature, it is effective to detect the environment humidity and the environment temperature and to control the illumination of the ultraviolet ray on the basis of the detected results, in order to stabilize the curing property of the ink.

Matsumoto discloses a temperature sensor for detecting the environmental temperature, and an ultraviolet ray illuminating means which can change an illumination intensity or an illumination amount of ultraviolet ray.

However, Matsumoto describes the technique on lines 25-39 in column 12, as follows. "drying speed correlated with environmental temperature or humidity may be previously obtained in view of conditions of placing the ink jet printer, so as to compensate for drive data of the heating elements. As illustrated in FIG. 1, a temperature sensor S1 and a humidity sensor S2 are provided in the ink jet printer. Output signals from the sensors S1 and 52 are input to the system controller 31. Then the drive data compensator 68 in the system controller 31 in FIG. 8 compensates for drive data to be applied to the heating elements according to the output signals." That is, the technique of Matsumoto is **a heating control**, to compensate for drive data for heating elements according to the detected results of environmental temperature or humidity. This is quite different from the apparatuses of claims 1 and 12, which claim to detect the environment humidity and the environment temperature, thereof and to control the **illumination of the ultraviolet ray** on the basis of the detected results.

As described above, in the apparatuses of claims 1 and 12, because a cationic polymerization ink for ink-jetting having a photo-curable property which significantly changes is used, in a case of an environment in which the ink is hardly cured, the photo curable property is improved by giving an irradiation of a larger illumination of ultraviolet ray than that of an ordinary case. In other words, when detecting an environment in which ink is hardly cured, it is necessary that a control for curing the ink is immediately performed. However, according to Matsumoto, the heating control thereof needs a certain time to get a desired temperature, there is a problem of inadequate response. On the contrary, the illumination control of the ultraviolet ray according to the apparatuses of claims 1 and 12 gives a good response to control immediately on the basis of the detected results.

Although Matsumoto discloses charging an illumination intensity or an illumination amount of ultraviolet ray, according to the ejected ink amount, that is, a larger illumination intensity or a larger illumination amount of ultraviolet ray when the ejected ink amount is large, and a smaller illumination intensity or a smaller illumination amount of ultraviolet ray when the ejected ink amount is small, Matsumoto does not disclose detecting the environment humidity and the environment temperature, of the cationic polymerization ink and to control the illumination of the ultraviolet ray on the basis of the detected results, in order to stabilize

the curing property of the ink. Matsumoto does not disclose the cationic polymerization ink nor the specific problem thereof.

Additionally, cited reference of Ohta et al. (US 6,211,265 Bl) discloses a water base ink for ink-jetting. However, Ohta does not disclose nor suggest any cationic polymerization ink for ink-jetting, as claimed in claims 1 and 12, in which inhibition of polymerization occurs in the presence of water.

Thus, it is respectfully asserted that claims 1 and 12 are allowable.

C. The dependent claims.

As noted above, it is respectfully asserted that independent claim 1 is allowable, and therefore it is further respectfully asserted that dependent claims 2-9 are also allowable.

III. Conclusion.

Reconsideration and allowance of all of the claims is respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Please contact the undersigned for any reason. Applicants seek to cooperate with the Examiner including via telephone if convenient for the Examiner.

Respectfully submitted,

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